

6AQ5—5AQ5

BEAM PENTODE

DESCRIPTION AND RATING

The 6AQ5 is a miniature beam-power pentode designed for use in the audio-frequency power output stage of television and radio receivers. It may also be used as a triode-connected vertical deflection amplifier in television receivers. Within its maximum ratings, the performance of the 6AQ5 is equivalent to that of the 6V6-GT.

Except for heater ratings, the 5AQ5 is identical to the 6AQ5. In addition, the 5AQ5, as a result of its controlled heater warm-up characteristic, is especially suited for use in television receivers which employ series-connected heaters. When the 5AQ5 is used in conjunction with other 600-milliampere types which exhibit essentially the same heater warm-up characteristic, heater voltage surges across the individual tubes are minimized during the warm-up period.

GENERAL

ELECTRICAL

	5AQ5	6AQ5	
Cathode—Coated Unipotential			
Heater Voltage, AC or DC	4.7	6.3	Volts
Heater Current	0.6	0.45	Ampere
Heater Warm-up Time*	11	....	Seconds
Direct Interelectrode Capacitances, approximate†			
Grid-Number 1 to Plate		0.4	μμf
Input		8.0	μμf
Output		8.5	μμf

MECHANICAL

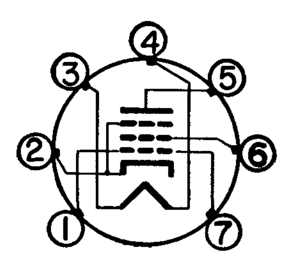
Mounting Position—Any
Envelope—T-5½, Glass
Base—E7-1, Miniature Button 7-Pin

MAXIMUM RATINGS

DESIGN-CENTER VALUES UNLESS OTHERWISE INDICATED

	Class A1 Amplifier	Vertical-Deflection Amplifier‡ (Triode Connection)§	
DC Plate Voltage	250	250	Volts
Peak Positive Pulse Plate Voltage		1100π	Volts
Screen Voltage	250	...	Volts
Peak Negative Grid-Number 1 Voltage		250	Volts
Plate Dissipation	12	9.0▲	Watts
Screen Dissipation	2.0	...	Watts
DC Cathode Current		35	Milliamperes
Peak Cathode Current		105	Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component	100	100	Volts
Total DC and Peak	200	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	200	200	Volts
Grid-Number 1 Circuit Resistance			
With Fixed Bias	0.1	...	Megohms
With Cathode Bias	0.5	2.2	Megohms
Bulb Temperature at Hottest Point	250	250	C

BASING DIAGRAM

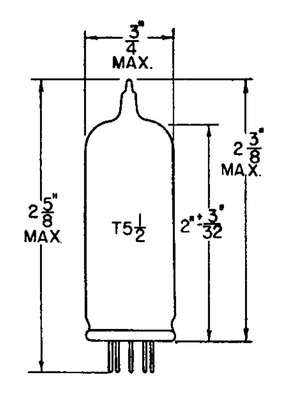


RETMA 7BZ

TERMINAL CONNECTIONS

Pin 1—Grid-Number 1
Pin 2—Cathode and Beam Plates
Pin 3—Heater
Pin 4—Heater
Pin 5—Plate
Pin 6—Grid-Number 2 (Screen)
Pin 7—Grid-Number 1

PHYSICAL DIMENSIONS



RETMA 5-3

CLASS A_1 AMPLIFIER

Plate Voltage	180	250	Volts
Screen Voltage	180	250	Volts
Grid-Number 1 Voltage	−8.5	−12.5	Volts
Peak AF Grid-Number 1 Voltage	8.5	12.5	Volts
Plate Resistance, approximate	58000	52000	Ohms
Transconductance	3700	4100	Micromhos
Zero-Signal Plate Current	29	45	Milliamperes
Maximum-Signal Plate Current	30	47	Milliamperes
Zero-Signal Screen Current	3.0	4.5	Milliamperes
Maximum-Signal Screen Current	4.0	7.0	Milliamperes
Load Resistance	5500	5000	Ohms
Total Harmonic Distortion, approximate	8	8	Percent
Maximum-Signal Power Output	2.0	4.5	Watts

PUSH-PULL CLASS AB_1 AMPLIFIER, VALUES FOR TWO TUBES

Plate Voltage	250	Volts
Screen Voltage	250	Volts
Grid-Number 1 Voltage	−15	Volts
Peak AF Grid-to-Grid Voltage	30	Volts
Zero-Signal Plate Current	70	Milliamperes
Maximum-Signal Plate Current	79	Milliamperes
Zero-Signal Screen Current	5.0	Milliamperes
Maximum-Signal Screen Current	13	Milliamperes
Effective Load Resistance, Plate-to-Plate	10000	Ohms
Total Harmonic Distortion	5	Percent
Maximum-Signal Power Output	10	Watts

AVERAGE CHARACTERISTICS, TRIODE CONNECTION§

Plate Voltage	250	Volts
Grid-Number 1 Voltage	−12.5	Volts
Amplification Factor	9.5	
Plate Resistance, approximate	1970	Ohms
Transconductance	4800	Micromhos
Plate Current	49.5	Milliamperes
Grid-Number 1 Voltage, approximate I_b=0.5 Milliampere	−37	Volts

* Heater warm-up time is defined as the time required in the circuit shown at the right for the voltage across the heater terminals to increase from zero to the heater test voltage (V_1). For this type, E=18.7 volts (RMS or DC), V_1=3.73 volts (RMS or DC), and R=23.5 ohms.

R
E
V
Heater of Tube under Test

† Without external shield.

‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

§ With screen tied to plate.

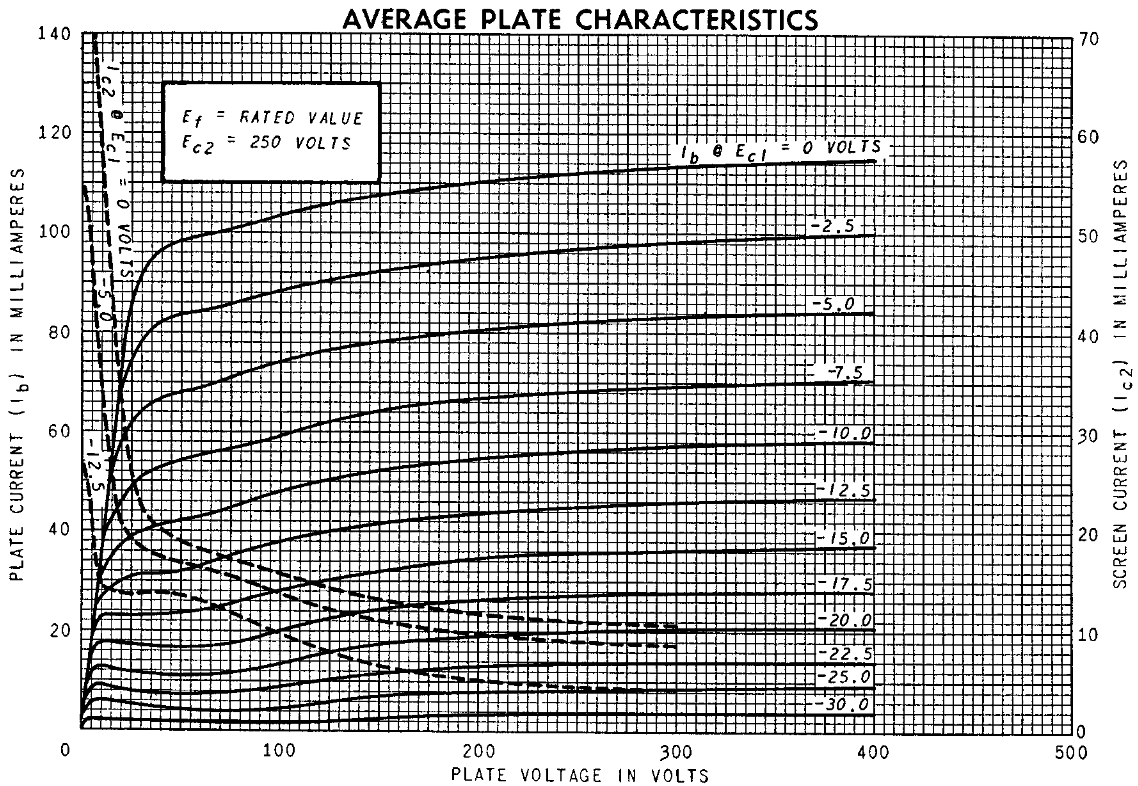
π Value given is to be considered as an Absolute Maximum Rating. In this case, the combined effect of supply voltage variation, manufacturing variation including components in the equipment, and adjustment of equipment controls should not cause the rated value to be exceeded.

▲ In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

AVERAGE PLATE CHARACTERISTICS

E_f = RATED VALUE
E_{c2} = 250 VOLTS

I_b @ E_{c1} = +15 VOLTS
+10
+5.0
0
-5.0
-10
-15
-20
I_{c1} @ E_{c1} = +15 VOLTS
+10
+5.0
PLATE CURRENT (I_b) IN MILLIAMPERES
GRID NUMBER 1 CURRENT (I_{c1}) IN MILLIAMPERES
PLATE VOLTAGE IN VOLTS



AVERAGE PLATE CHARACTERISTICS

E_f = RATED VALUE
E_{c1} = 0 VOLTS

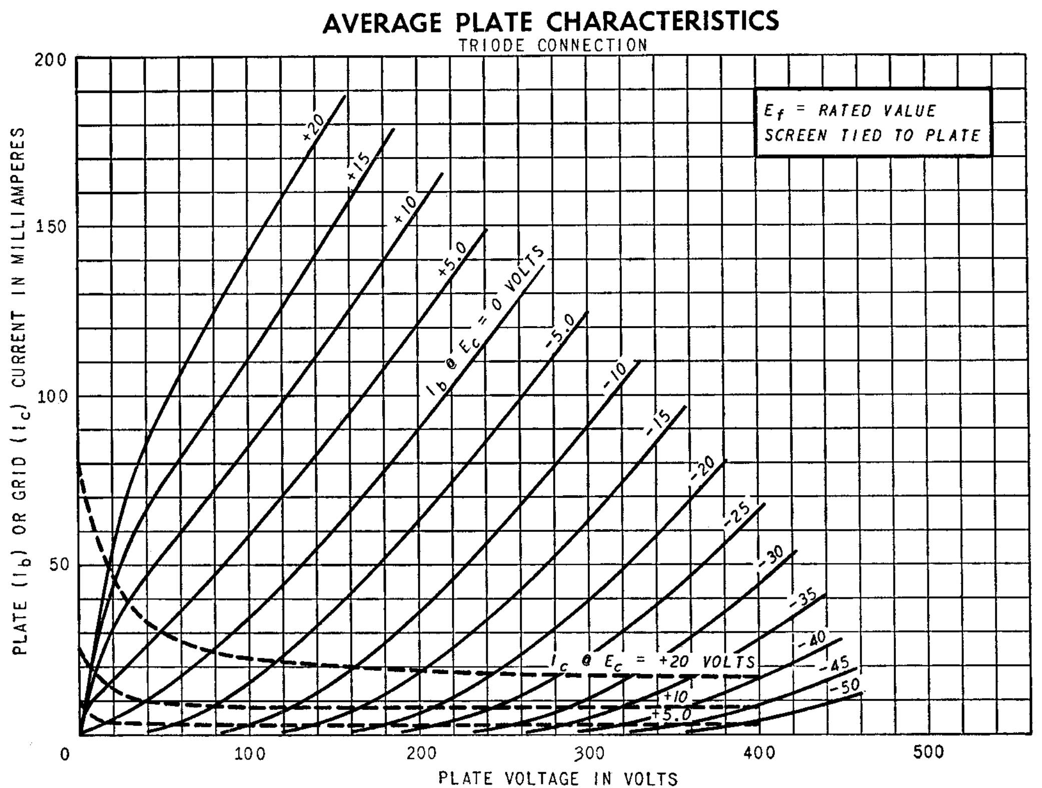
E_{c2} = 250 VOLTS
200
150
100

PLATE CURRENT IN MILLIAMPERES: 20, 40, 60, 80, 100, 120, 140

PLATE VOLTAGE IN VOLTS: 0, 100, 200, 300, 400, 500

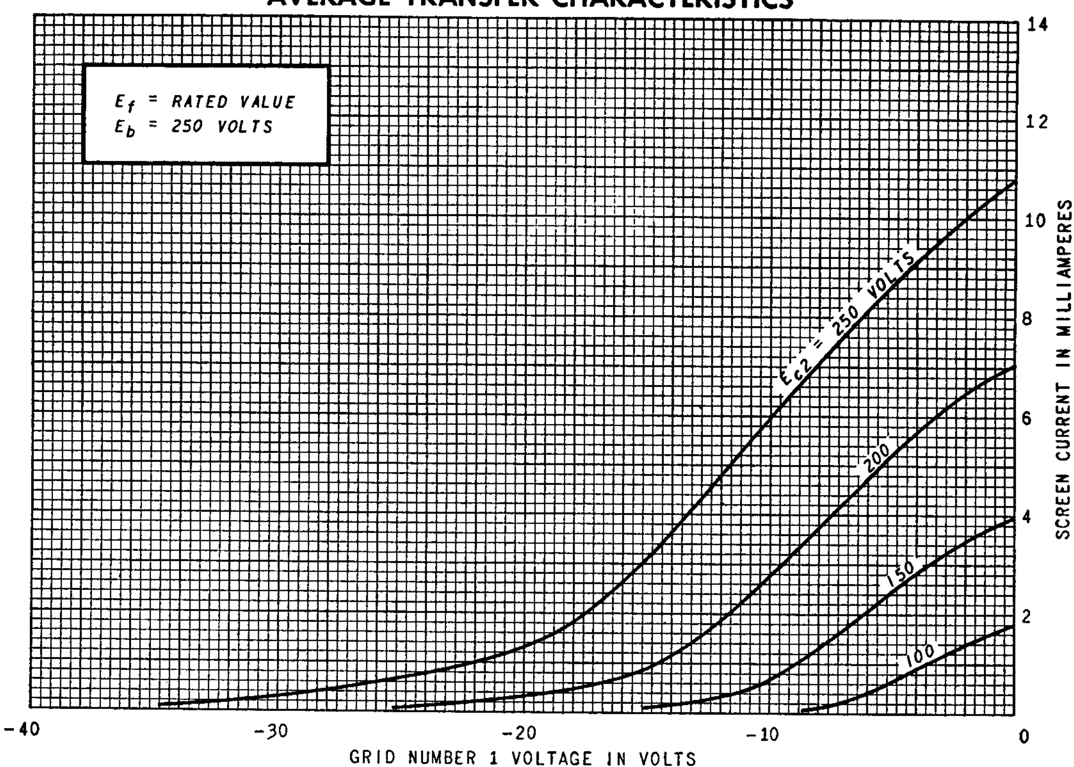
AVERAGE PLATE CHARACTERISTICS

TRIODE CONNECTION



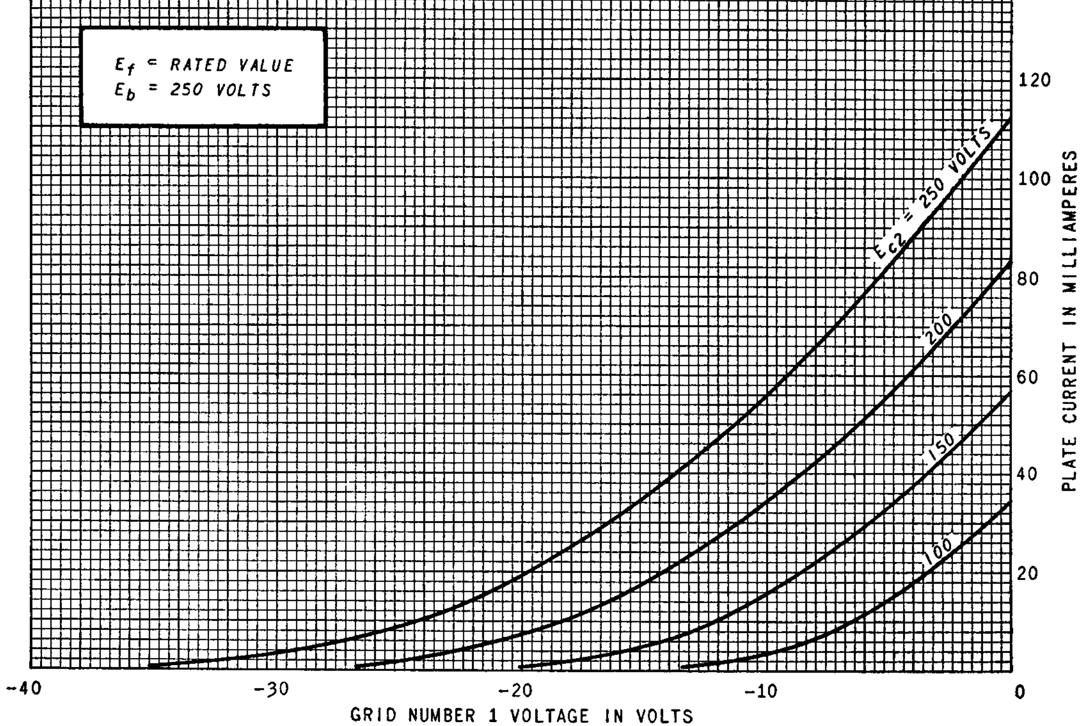


AVERAGE TRANSFER CHARACTERISTICS





AVERAGE TRANSFER CHARACTERISTICS



OPERATION CHARACTERISTICS

E_f = RATED VALUE
E_b = 250 VOLTS
E_{c2} = 250 VOLTS
E_{c1} = −12.5 VOLTS
E_{sig} = 8.8 VOLTS (RMS)

PLATE CURRENT
POWER OUTPUT
DISTORTION
SCREEN CURRENT

TOTAL HARMONIC DISTORTION IN PERCENT: 0, 4, 8, 12, 16, 20, 24, 28
POWER OUTPUT IN WATTS: 0, 1, 2, 3, 4, 5, 6, 7
MAXIMUM-SIGNAL PLATE OR SCREEN CURRENT IN MILLIAMPERES: 0, 10, 20, 30, 40, 50, 60, 70
LOAD RESISTANCE IN OHMS: 2000, 4000, 6000, 8000, 10000



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